

LAWRENCE LIVERMORE REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: June 30-July 7, 2008.

Lab innovations win three more 'Oscars'



Lawrence Livermore National Laboratory researchers have garnered three of the top 100 industrial innovations worldwide in 2007, developing advanced technologies with commercial potential.

The annual R&D 100 awards, often called the "Oscars of invention," are awarded by the trade publication, *R&D Magazine*.

"LLNL's three R&D 100 awards show the Laboratory continues to be a source of creative technologies that benefit the nation and U.S. industry," said Erik Stenehjelm, the leader of the Laboratory's Industrial Partnerships Office. "These advances demonstrate the Laboratory's tradition of using multidisciplinary teams working together to solve important national problems."

The Laboratory has captured a total of 121 such awards since 1978. This year's winners include:

-- SecureBox, a low-cost, reliable, reusable advanced system to improve the security of cargo containers during shipping. This award was won in collaboration with Secure Box Corp. of Santa Clara and the National Infrastructure Institute Center for Infrastructure Expertise of Portsmouth, N.H.

-- Autonomous alignment process for laser fusion systems, or AAPLF, a revolutionary "hands-off" system that directs and aligns multiple high-energy laser beams to enable controlled manmade fusion reactions.

-- Dynamic Transmission Electron Microscope, which provides the highest resolution ever for digital imaging of ultrafast material processes on the billionth of a meter scale. This work has been done in collaboration with JEOL USA Inc., a Peabody, Mass.-based company.

For more on the R&D 100s, see
https://publicaffairs.llnl.gov/news/news_releases/2008/NR-08-07-01.html

Three Lab technologies and one researcher earn Nano 50 Awards



Three Laboratory technologies and one Lab researcher have been named winners in the fourth annual *Nanotech Briefs* Nano 50 Awards.

The dynamic transmission electron microscope (DTEM) and the design and fabrication of functional nanopores have been named winners in technology category, while the nanolipoprotein particle formation method won in the product category. Yinmin (Morris) Wang won in the innovator category for his nanoscale research.

Presented by *Nanotech Briefs* -- the monthly digital newsletter from Tech Briefs Media Group (publishers of *NASA Tech Briefs*) -- the Nano 50 recognizes the top 50 technologies, products and innovators that have significantly impacted, or are expected to impact, the state of the art in nanotechnology. The winners of the Nano 50 awards are the "best of the best" -- the innovative people and designs that will move nanotechnology to key mainstream markets.

Wang's research focuses on the mechanical behavior of bulk nanostructured materials and nanolaminates, semi-conducting nanowires, mass-transport behavior of nanotubes and transmission electron microscopy.

A team of Livermore scientists and engineers developed DTEM, which provides the highest resolution ever for digital imaging of ultrafast material processes on the billionth of a meter scale. DTEM also won an R&D100 award (see above).

Nanolipoprotein particle (NLP) formation consists of nanometer-sized complexes that enable the study of proteins that are particularly challenging to capture in the native form, due to being associated with cell membranes. Laboratory researcher Paul Hoeprich devised the NLP technique.

LLNL's Sonia Letant is in charge of the design and fabrication of functional nanopores. She has studied nanoparticles as a hydrogen catalyst as well as silicon oxide pores in tap water.

LLNS gift program provides support to community



Lawrence Livermore National Security, LLC (LLNS) has announced the recipients of its 2008 Community Gift Program. LLNS manages Lawrence Livermore National Laboratory (LLNL) for the Department of Energy's National Nuclear Security Administration.

The monetary gifts, totaling \$100,000, reflect LLNS' commitment to being a good neighbor and making a positive contribution to local communities.

LLNS received 141 applications totaling nearly \$1.7 million in requests. Twenty applications were selected for awards through a committee review process. The majority of these awards serve children in the Tri-Valley and San Joaquin County areas of Northern California, with a focus on science and math education and cultural arts.

"LLNS is committed to being a good neighbor in our local communities and is proud to lend its support," said George Miller, LLNS president and LLNL director. "These gifts are an investment in our communities as well as in the science and engineering of tomorrow."

For individual recipients, or more information on the Community Gift Program, see the LLNS Website at <http://www.llnslc.com/communityGiving/llnsgift.asp>

Red Cross honors Lab for continuous donations

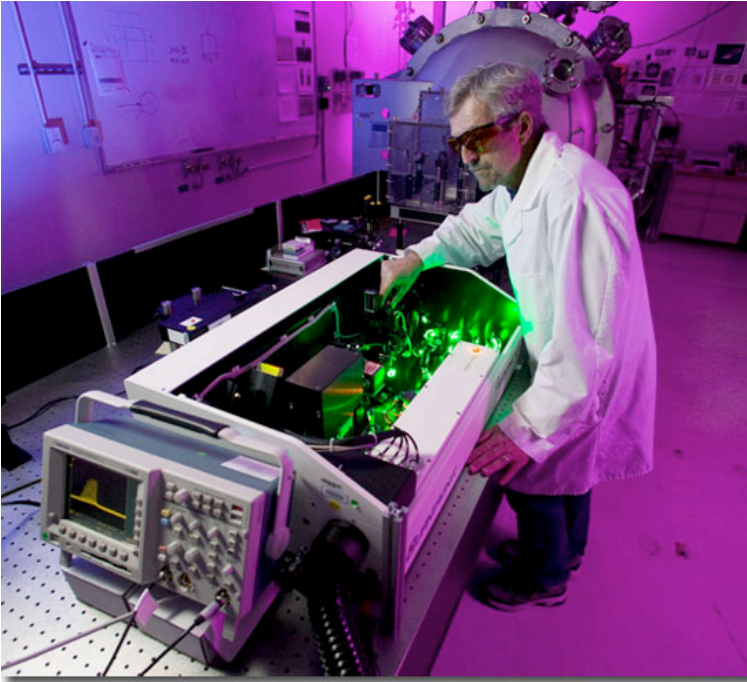


The American Red Cross Northern California Blood Services Region recently sent a letter to Lab Director George Miller commending employees for their years of support.

Lawrence Livermore is one of the region's largest corporate sponsors of blood drives. For more than 25 years, Lab employees have donated blood at LLNL blood drives. The Red Cross provides blood products to 31 hospitals throughout the Bay Area. Each unit of blood donated by an LLNL employee can help save up to three lives of patients in their communities.

The Laboratory was one of the early adopters of Red Cross' "Adopt a Drive" and "Online Appointment Scheduling System" programs.

Photo of the week



Flashes in femtoseconds -- Within the Laboratory's High Explosive Application Facility (also known as HEAF), Livermore researchers such as Jerry Benterou are using the Femtosecond Laser to machine high explosives for experiments to ensure the U.S. nuclear stockpile remains safe and secure. The laser, which provides precision pulses at billionths of a millionth of a second, helps scientists gain insight in materials research and plasma physics. Femtosecond pulses also allow scientists to observe condensed-phase dynamics such as crack formation, phase separation and rapid fluctuations in the liquid state.

Photos of the week photographer: Jacqueline McBride/LLNL

LLNL is managed by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy's National Nuclear Security Administration.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-

density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

To send input to the Livermore Lab Report, send e-mail <mailto:labreport@llnl.gov>.

The Livermore Lab Report archive, including today's issue, is available at:
https://publicaffairs.llnl.gov/news/lab_report/2008index.html